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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,716	08/08/2003	Norbert Kerner	56/411	3522

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EXAMINER	
MILLER, PATRICK L	
ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/637,716	KERNER ET AL.	
	Examiner	Art Unit	
	Patrick Miller	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4,7-10,13 and 16 is/are rejected.

7)☒ Claim(s) 5,6,11,12,14,15 and 17-20 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 08 August 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12052003;02262004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: See bullet(s) below. Appropriate correction is required.

   - Page 7 of the specification is not technically accurate, since the output device does not display the quotient acoustically. The output device would output the quotient acoustically.

Claim Objections

2. Claims 1-20 are objected to because of the following informalities: See bullets below. Appropriate correction is required.

   - Claim 1 recites, "the mass moment of inertia of an electric motor drive system" (lines 1 and 2). Change "the" to "a."
   - Claim 1 recites, "a mass moment of inertia of said electric motor drive system" (line 9). Change "a" to "the" or "said."
   - Claim 1 recites, "a motor speed" (line 5). It is unclear whether this motor speed that remains constant is the same as the "a constant speed of said motor" (lines 4 and 5). Please clarify.
   - Claim 5 recites, "to [sic] of said at least one motor speed have the same value." This does not make sense, since two motor speeds have not been defined yet.
   - Claim 9 recites, "two different accelerations." Claim 1 does not recite more than one defined acceleration.

- Claim 14 recites, "an acceleration of said drive motor." It is unclear whether this acceleration is the same as that cited in claim 1, line 6 (a defined acceleration). Please clarify.
- Claim 16 recites, "a total mass moment of inertia of said drive system" (line 3). It is unclear whether this total inertia is the same as the calculated inertia of the electric motor drive system cited in claim 1 (line 9). Please clarify.
- Claim 19 recites, "said displaying is a visual display." Displaying, by its definition, means visually. Therefore, this claim does not further limit claim 18. See specification, page 7 ("by a screen, a printer, or the like").
- Claim 20 recites, "said displaying is an audio display." Display means visually, which means audio is not displayed, but rather, an audio is output acoustically. Page 7 of the specification is not technically accurate, since the output device does not display the quotient acoustically. The output device would output the quotient acoustically.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- The specification discloses determining compensation current using a feedforward current, but does not disclose said current being output from a revolution speed controller (page 10).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii et al (5,175,483).

- Fujii et al disclose a method for determining a mass moment of inertia of an electric motor drive system of a machine, comprising a drive motor and additional drive elements (Fig. 1, #6 and other components), the method comprising: determining a compensation current that compensates losses occurring at a constant motor speed (col. 2, lines 11-14; input into Equation 1); determining an acceleration current that generates a defined acceleration of the drive motor when losses are compensated (col. 2, lines 15-19); and calculating the mass moment of inertia based on the determined acceleration current (col. 2, lines 20-25; Equation 1 is total moment of inertia for system).
- With respect to claims 2 and 3, the compensation current is for driving the motor at a constant speed for at least one motor speed or two different motor speeds (Fig. 9, three constant speed areas).

- With respect to claim 9, determining acceleration current comprises operating the drive motor at two different accelerations (Fig. 9, col. 2, lines 34-49).
- With respect to claim 10, the two different accelerations have different signs, i.e., can calculate for acceleration and deceleration (col. 2, lines 45-49).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al as applied to claim 1 above, and further in view of Rehm et al (6,144,181).
   - Fujii et al do not disclose determining a mass moment of inertia of a load by subtracting the mass moment of inertia of the motor from the total mass moment of inertia of the drive system.
   - Rehm et al teach that the load inertia can be calculated by subtracting the motor inertia from the total inertia. Rehm et al also disclose that the motor inertia is typically given for a particular motor (col. 9, lines 27-37). The motivation to calculate the load inertia as described is to provide the advantage of compensating resonances caused by specific load inertias (abstract).
   - Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the total system inertia as calculated by Fujii et al and the given

motor inertia to calculate the load inertia, thereby providing the advantage of compensating resonances caused by specific load inertias, as taught by Rehm et al.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Didier et al (4,607,408) in view of Rehm et al (6,144,181).

- Didier et al disclose a method for determining a mass moment of inertia of an electric motor drive system of a machine, comprising a drive motor and additional drive elements (Fig. 4; col. 2, lines 42-54), the method comprising: determining a compensation current that compensates losses occurring at a constant motor speed (Fig. 2, current between times, t2 and t3); determining an acceleration current that generates a defined acceleration of the drive motor when losses are compensated (Fig. 2, since the current at t3 is the known compensation current, the current between time, t3 and t4 is the known acceleration current taking into consideration the compensation current); and calculating the mass moment of inertia based on the determined acceleration current (col. 6, lines 44-56).
- Didier et al disclose calculating the mass moment of inertia for the load, but do not disclose calculating the mass moment of inertia for the electric drive system.
- Rehm et al teach that the total mass moment of inertia can be calculated by subtracting the motor inertia from the load inertia. Rehm et al also disclose that the motor inertia is typically given for a particular motor (col. 9, lines 27-37). The motivation to calculate the total system inertia as described above is to supply the necessary current to the motor based on the system inertia requirements. This provides the advantage of improving system efficiency and increasing the motor's life.

- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to calculate the mass moment of inertia of the electric motor system using the given motor inertia, and the load inertia calculated as in Didier et al, thereby providing the advantage of improving system efficiency and increasing the motor's life, as taught by Rehm et al.
- With respect to claim 2, Didier et al disclose determining compensation current comprises determining the current required to drive the motor at a constant speed (Figs. 1 and 2, current between t2 and t3 drives at a constant speed, V23).
- With respect to claim 3, Didier et al disclose the motor speed comprises at least two different speeds (Fig. 1, motor has two constant speeds, between t2 and t3 and t4 and t5, respectively).
- With respect to claim 4, Didier et al disclose the speed remains constant for a presettable length of time (Fig. 1, set time is from t2 to t3; set based on the speed requirements; col. 4, lines 39-57).

7. Claims 1, 2, 7, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al (EP 1088674 A1) in view of Rehm et al (6,144,181).
   - Igarashi et al disclose a method for determining a mass moment of inertia of an electric motor drive system of a machine, comprising a drive motor and additional drive elements (Fig. 1, #4 and additional drive elements), the method comprising: determining a compensation current that compensates losses occurring at a constant motor speed (page 6, lines 37-38; If is the friction or compensation current); determining an acceleration current that generates a defined acceleration of the drive motor when losses are

compensated (page 6, Equation 1, Icc – If is the actual acceleration current); and calculating the mass moment of inertia based on the determined acceleration current (page 6, Equation 1).

- Igarashi et al disclose calculating the mass moment of inertia for the load, but do not disclose calculating the mass moment of inertia for the electric drive system.
- Rehm et al teach that the total mass moment of inertia can be calculated by subtracting the motor inertia from the load inertia. Rehm et al also disclose that the motor inertia is typically given for a particular motor (col. 9, lines 27-37). The motivation to calculate the total system inertia as described above is to supply the necessary current to the motor based on the system inertia requirements. This provides the advantage of improving system efficiency and increasing the motor's life.
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to calculate the mass moment of inertia of the electric motor system using the given motor inertia, and the load inertia calculated as in Igarashi et al, thereby providing the advantage of improving system efficiency and increasing the motor's life, as taught by Rehm et al.
- With respect to claim 2, Igarashi et al disclose the compensation current is determined at a constant speed (page 2, section [0011]).
- With respect to claim 7, Igarashi et al disclose the method produces a stop current to stop the driven load at a specific location. Therefore, the method controls the number of revolutions (sections [0054]-[0056]).

- With respect to claim 13, Igarashi et al disclose determining acceleration comprises forming a difference between a total torque current and the compensation current (page 6, numerator of Equation 1).

Allowable Subject Matter

8. Claims 5, 6, 11, 12, 14, 15, and 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable once the minor informalities are corrected and if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- With respect to claim 5, the Prior Art does not disclose a method for determining a mass moment of inertia of an electric motor system with the limitations of claims 1 and 2, and with the further limitation that the at least one motor speed comprises two constant motor speeds, and the two constant motor speeds have the same value, but opposite signs.
- With respect to claims 11 and 12, the Prior Art does not disclose presetting the amount of time that each of the two accelerations remain constant.
- With respect to claim 14, the Prior Art does neither provides motivation to equate two formulations of an acceleration of the drive motor with the Fujii et al, Didier et al, or Igarashi et al references, respectively, to calculate the mass moment of inertia of the electric motor system, nor equates two acceleration formulations to calculate the mass moment of inertia of the electric motor system as described in claim 1.
- With respect to claim 17, the Prior Art does not disclose the limitations of claims 1 and 16, and the further limitation of calculating the ratio of the mass moment of inertia for the drive motor to the mass moment of inertia of the load.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 41. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Miller
Examiner
Art Unit 2837

pm
September 25, 2004

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